

### Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

### Listing of Claims:

1. (Currently Amended) A method for the production of an aromatic or hetroaromatic fluorine-labelled compound comprising fluoridation of an iodonium salt of Formula (I) or (II):



wherein:

Q is an electron deficient aromatic or heteroaromatic moiety;

each of R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> is independently hydrogen, -O(C<sub>1-10</sub> alkyl) or C<sub>1-10</sub> alkyl; and

Y<sup>-</sup> is a counter ion such as trifluoromethane sulfonate (triflate), perfluoro C<sub>2</sub>-C<sub>10</sub> alkyl sulphonate, trifluoroacetate, methane sulfonate (mesylate), toluene sulfonate, (tosylate), tetraphenylborate;

to give a product of general formula (III):



where Q is substituted with one or more substituents selected from C<sub>1-10</sub> alkyl, -O(C<sub>1-10</sub> alkyl), -C(=O) C<sub>1-10</sub> alkyl, -C(=O)NR<sup>6</sup>(C<sub>1-10</sub> alkyl), -(C<sub>1</sub>-C<sub>6</sub> alkyl)-O-(C<sub>1</sub>-C<sub>6</sub> alkyl), C<sub>5-14</sub> aryl,

~~-O(C<sub>5-14</sub> aryl), -C(=O)C<sub>5-14</sub> aryl, -C(=O)NR<sup>6</sup>(C<sub>5-14</sub> aryl, C<sub>5-14</sub> heteroaryl, -O(C<sub>5-14</sub> heteroaryl), -C(=O)C<sub>5-14</sub> heteroaryl, -C(=O)NR<sup>6</sup>(C<sub>5-14</sub> heteroaryl), C<sub>3-10</sub> cycloalkyl, -O(C<sub>3-10</sub> cycloalkyl), -C(=O)(C<sub>3-10</sub> cycloalkyl), -C(=O)NR<sup>6</sup>(C<sub>3-10</sub> cycloalkyl), C<sub>3-10</sub> heterocyclyl, -O(C<sub>3-10</sub> heterocyclyl), -C(=O)(C<sub>3-10</sub> heterocyclyl), -C(=O)NR<sup>6</sup>(C<sub>5-14</sub> heterocyclyl) with a fluoride ion source characterised in that the reaction solvent is either 100% water or a mixture of water and a water miscible solvent comprises water.~~

2. (Cancelled) ~~A method as claimed in claim 1, wherein the reaction solvent is 100% water.~~
3. (Cancelled) ~~A method as claimed in claim 1 wherein the reaction solvent is a mixture of water and a water miscible solvent.~~
4. (Currently Amended) A method as claimed in claim 1 ~~3~~, wherein the water miscible solvent is acetonitrile, ethanol, methanol, tetrahydrofuran or dimethylformamide.
5. (Currently Amended) A method as claimed in claim 1 ~~3~~ wherein the volume:volume ratio of water:water-miscible solvent is between 1:99 and 1:1.
6. (Original) A method as claimed in claim 5 wherein the volume:volume ratio of water:water-miscible solvent is from 10:90 to 30:70.
7. (Previously presented) A method as claimed in claim 1, wherein the fluoride ion source is potassium, caesium or sodium fluoride.
8. (Cancelled) ~~A method as claimed in claim 1 for the fluoridation of an iodonium salt of Formula (I) or (II):~~



wherein:

Q is an electron deficient aromatic or heteroaromatic moiety;

each of  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$  and  $R^5$  is independently hydrogen,  $\text{O}(\text{C}_{1-10}\text{-alkyl})$  or  $\text{C}_{1-10}\text{-alkyl}$ ; and

$Y^-$  is a counter ion such as trifluoromethane sulfonate (triflate), perfluoro  $\text{C}_2\text{--C}_{10}$  alkyl sulphate, trifluoroacetate, methane sulfonate (mesylate), toluene sulfonate (tosylate), tetraphenylborate;

to give a product of general formula (III):



where Q is as defined for general formulae (I) and (II).

9. (Currently Amended) A method as claimed in claim 1 8, wherein each of  $R^1$ – $R^5$  is independently selected from hydrogen,  $\text{C}_{1-3}$  alkyl and  $-\text{O}-(\text{C}_1\text{--C}_3 \text{ alkyl})$ .

10. (Currently Amended) A method as claimed in claim 1 8 wherein, in the compound of Formula II, the “solid support” is polystyrene, polyacrylamide, polypropylene or glass or silicon coated with such a polymer.

11. (Currently Amended) A method as claimed in claim 1 8 wherein the solid support is in the form of small discrete particles or is a coating on the inner surface of a reaction vessel.

12. (Currently Amended) A method as claimed in claim 1 8, wherein, in the compound of Formula II the "linker" is C<sub>1-20</sub> alkyl or C<sub>1-20</sub> alkoxy, attached to the resin by an amide ether or a sulphonamide bond or a polyethylene glycol (PEG) linker.

13. (Currently Amended) A method as claimed in claim 1 8 ~~wherein the aromatic group Q is substituted with one or more substituents selected from C<sub>1-10</sub> alkyl, O(C<sub>1-10</sub> alkyl), C(=O)C<sub>1-10</sub> alkyl, C(=O)NR<sup>6</sup>(C<sub>1-10</sub> alkyl), (C<sub>1</sub>-C<sub>6</sub> alkyl) O (C<sub>1</sub>-C<sub>6</sub> alkyl), C<sub>8-14</sub> aryl, O(C<sub>8-14</sub> aryl), C(=O)C<sub>8-14</sub> aryl, C(=O)NR<sup>6</sup>(C<sub>8-14</sub> aryl), C<sub>8-14</sub> heteroaryl, O(C<sub>8-14</sub> heteroaryl), C(=O)C<sub>8-14</sub> heteroaryl, C(=O)NR<sup>6</sup>(C<sub>8-14</sub> heteroaryl), C<sub>2-10</sub> cycloalkyl, O(C<sub>2-10</sub> cycloalkyl), C(=O)(C<sub>2-10</sub> cycloalkyl), C(=O)NR<sup>6</sup>(C<sub>2-10</sub> cycloalkyl), C<sub>2-10</sub> heterocyclyl, O(C<sub>2-10</sub> heterocyclyl), C(=O)(C<sub>2-10</sub> heterocyclyl), C(=O)NR<sup>6</sup>(C<sub>2-10</sub> heterocyclyl),~~

wherein R<sup>6</sup> is H, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>3</sub>-C<sub>10</sub> cycloalkyl, C<sub>3</sub>-C<sub>10</sub> heterocyclyl, C<sub>4</sub>-C<sub>10</sub> aryl or C<sub>4</sub>-C<sub>10</sub> heteroaryl;

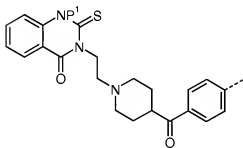
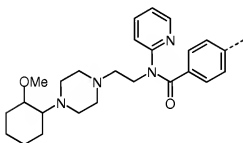
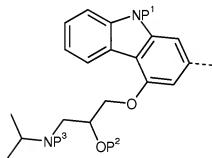
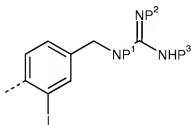
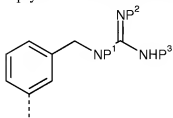
any of which may optionally be substituted with OH, NHR<sup>6</sup>, COOH or protected versions any of these groups; or alternatively

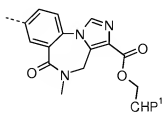
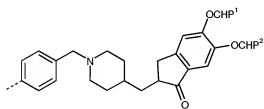
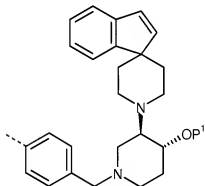
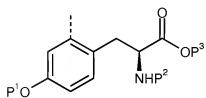
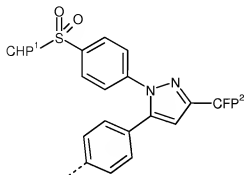
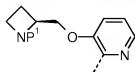
any two adjacent substituents may form a four- to six-membered carbocyclic or heterocyclic ring, optionally fused to a further aromatic, heteroaromatic, carbocyclic or heterocyclic ring.

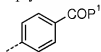
14. (Currently Amended) A method as claimed in claim 1 13, wherein the aromatic moiety Q has an additional substituent selected from OH, NHR<sup>6</sup> or halogen.

15. (Currently Amended) A method as claimed in claim 1 8, wherein the group Q is one of the following:



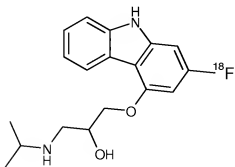
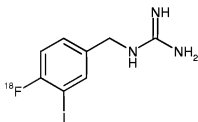
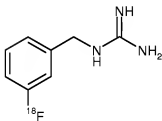
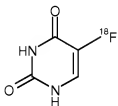


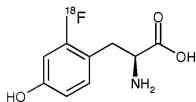
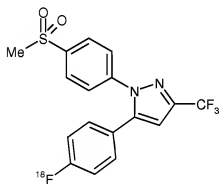
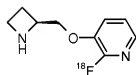
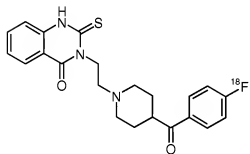
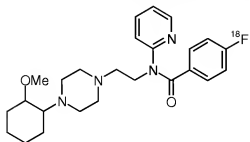




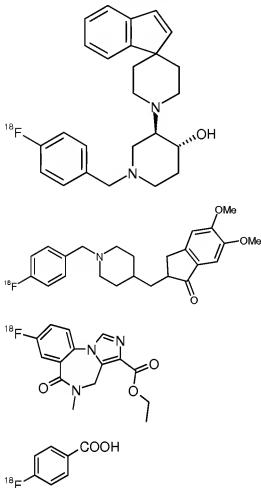
16. (Previously presented) A method as claimed in claim 1, wherein the fluorine-labelled compound is an [ $^{18}\text{F}$ ]-labelled compound and the fluoride ion source is a source of  $^{18}\text{F}^-$ .

17. (Previously presented) A method as claimed in claim 1, wherein the F-labelled compound is selected from the following:









18. (Previously presented) A method as claimed in claim 1, further including, in any order, one or more of the following steps: removal of excess  $^{18}\text{F}^-$ , for example by ion-exchange chromatography; and/or

- (i) removal of the protecting groups; and/or
- (ii) removal of organic solvent; and/or
- (iii) formulation of the resultant compound as an aqueous solution.

19. (Original) A kit for the production of an aromatic fluorine-labelled compound, the kit comprising:

- (i) a vial containing an aqueous solvent for dissolving the fluoride ion source; and

Appl. No. 10/559,878  
Amdt. Dated October 30, 2008  
Reply to Office action of August 5, 2008  
(ii) a reaction vessel containing an iodonium salt.

20. (Original) A kit as claimed in claim 19, wherein the solvent is 100% water.
21. (Original) A kit as claimed in claim 19 wherein the solvent is a mixture of water and a water miscible solvent.
22. (Original) A kit as claimed in claim 21, wherein the water miscible solvent is acetonitrile, ethanol, methanol, tetrahydrofuran or dimethylformamide.
23. (Previously presented) A kit as claimed in claim 21 wherein the volume:volume ratio of water:water-miscible solvent is between 1:99 and 1:1.
24. (Original) A kit as claimed in claim 23 wherein the volume:volume ratio of water:water-miscible solvent is from 10:90 to 30:70.
25. (Previously presented) A kit as claimed in claim 19 wherein the iodonium salt is compound of general formula (I) or (II).
26. (Previously presented) A kit as claimed in claim 20 wherein the iodonium salt is a compound of general formula (II) and the solid support comprises a coating on the surface of the reaction vessel.
27. (Previously presented) A kit as claimed in claim 19, wherein the reaction vessel is a cartridge or a microfabricated vessel.
28. (Previously presented) A kit as claimed in claim 19, further comprising a source of fluoride ions.